

REMARKS/ARGUMENT

Claim 1 has been amended by incorporating subject matter of claim 13 into it.

Claim 13 has been canceled.

New claim 31 has been added, requiring the underlayer to be Ba and/or Sr TiO₃, support for which exists, *inter alia*, at page 5, lines 26-28 of the present specification and original claim 13.

Claims 1-12 and 14-31 are currently pending, although claims 16-19 and 27-30 have been withdrawn from consideration. Upon indication of allowable subject matter, Applicants currently intend to seek rejoinder of withdrawn claims as appropriate.

The Office Action rejected claims 1-4, 9-12, 14, 15 and 21-25 under 35 U.S.C § 102 as anticipated by U.S patent 6,436,542 (“Ogino”); claims 1-5, 9-11, 13-15, 20, 21, 25 and 26 under 35 U.S.C § 102 as anticipated by U.S patent 6,576,344 (“Doushita”); claims 6-8 under 35 U.S.C § 103 as obvious over Doushita; and claims 13, 20 and 26 under 35 U.S.C § 103 as obvious over Ogino in view of U.S patent 6,103,363 (“Boire”). In view of the following comments, Applicants respectfully request reconsideration and withdrawal of these rejections.

Initially, Applicants note that the anticipation rejection based upon Ogino and the obviousness rejection based solely upon Doushita did not encompass claim 13. Accordingly, Applicants respectfully submit that the above amendment to claim 1 in which subject matter of claim 13 was incorporated into claim 1 renders these rejections moot, and that these rejections should be reconsidered and withdrawn.

Regarding the remaining anticipation rejection based upon Doushita, Doushita does not teach or suggest the required underlayer. The required underlayer has a crystallographic structure for assisting in the crystallization by heteroepitaxial growth in the anatase form of

the TiO₂-based upper layer. Contrary to the Office Action's assertions, Doushita's alkali barrier layer is not the claimed underlayer.

At col, 4, lines 18-32, Doushita states that without an alkali barrier layer, the alkali will migrate into the photocatalytic coating during heat treatments and lower the crystallinity of TiO₂. Preferred alkali barrier layers are SiO₂ and SiO₂/ZrO₂. However, such alkali barrier layers cannot qualify as underlayers having a crystallographic structure for assisting in the crystallization by heteroepitaxial growth in the anatase form of the TiO₂-based upper layer as required in the pending claims. Here, "heteroepitaxial growth" connotes that the underlayer has a crystallographic structure sufficiently close to that of anatase to promote a subsequent growth of TiO₂ in anatase form.

Doushita's SiO₂ and SiO₂/ZrO₂ coatings are amorphous, or even if some crystallization is present in the coatings, it will not promote epitaxial growth of anatase form of TiO₂. No evidence to the contrary exists, and nothing in Doushita can be interpreted to disclose such a result. Doushita's alkali barrier coatings merely allow the TiO₂ coating to be unpolluted by alkali during heat treatments that can be performed after the deposition of TiO₂. In this way, the alkali barrier layer can impede any "lowering of crystallization" during such heat treatments. But this does not imply or suggest that these alkali barrier layers promote an epitaxial growth of anatase during the deposition of the TiO₂ coating. Doushita's alkali barrier layers play a completely different role and have a completely different function as compared to the claimed underlayers

Clearly, Doushita neither teaches nor suggests the claimed invention.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102.

Regarding the remaining obviousness rejection based upon Ogino and Boire, the Office Action recognized that Ogino neither teaches nor suggests the claimed underlayer.

Boire cannot compensate for Ogino's fatal deficiencies. Ogino discloses producing a titanium dioxide layer only by sputtering, not by CVD deposition. (See, col. 2, lines 22-34). In stark contrast, Boire teaches, at col. 6, lines 20-30, creating a crystallization-promoting layer under a titanium dioxide layer deposited by CVD deposition. Thus, one of ordinary skill in the art, seeking to produce a titanium dioxide layer on Boire's crystallization-promoting layer, would do so by CVD deposition, not sputtering, based on Boire's disclosure. That is, one of ordinary skill in the art would not look to utilize Boire's crystallization promoting layer invention in Ogino's methods because of the different methods of depositing the titanium dioxide layers. In other words, the disclosures of Ogino and Boire are not combinable, so together they could not lead to the claimed invention.

This is particularly true for new claim 31. None of the applied art, including Boire, teaches or suggests the specified underlayer of claim 31. Thus, the combination of the applied art does not disclose each and every element of the invention of claim 31, so the combination cannot lead to the claimed invention.

In view of the above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C §103.

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Applicants believe that the present application is in condition for allowance. Prompt and favorable consideration is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Norman F. Oblon



Jeffrey B. McIntyre
Registration No. 36,867

Customer Number

22850

Tel #: (703) 413-3000

Fax #: (703) 413-2220